

CLAIM AMENDMENTS

1. (Currently Amended) An optical functional device comprising:
a first port,
a second port,
a first splitter branching said first port to a first arm and a second arm,
a second splitter branching said second port to said first arm and said second arm,
a first semiconductor optical amplifier disposed on said first arm,
a second semiconductor optical amplifier disposed on said second arm, and
a phase control element disposed between said first semiconductor optical amplifier
and said second splitter on said first arm, wherein
constant light is input from ~~either~~ one of said first port ~~or~~ and said second port,
and
input signal light is input from ~~either~~ one of a first site between said first
splitter and said first semiconductor optical amplifier ~~or another~~ and a second site
between said first semiconductor optical amplifier and said phase control element.

2. (Original) The optical functional device according to claim 1, said optical
functional device being employed as a wavelength converter.

3. (Currently Amended) An optical functional device comprising:
a first port,
a second port,
a first splitter branching said first port to a first arm and a second arm,
a second splitter branching said second port to said first arm and said second arm,
a first semiconductor optical amplifier disposed on said first arm,
a second semiconductor optical amplifier disposed on said second arm,
a first phase control element disposed between said first semiconductor optical
amplifier and said second splitter on said first arm, and
a second phase control element disposed between said second semiconductor optical
amplifier and said second splitter on said second arm, wherein
constant light is input from ~~either~~ one of said first port ~~or~~ and said second port,
and
input signal light is input from ~~either~~ one of a first site between said first
splitter and said first semiconductor optical amplifier ~~or another~~ and a second site

between said first semiconductor optical amplifier and said first phase control element.

4. (Original) The optical functional device according to claim 3, said optical functional device being employed as a wavelength converter.

5. (Currently Amended) A ~~fabrication~~ method of fabricating an optical functional device comprising:

~~an optical waveguiding layer production step of forming a ~~clad~~ cladding layer of a first conductivity type, an optical amplifying layer, and a first ~~clad~~ cladding layer of a second conductivity type sequentially on a semiconductor substrate,~~

~~a waveguide production step of composition-modifying a part of said ~~clad~~ cladding layers of the first and second conductivity types into a ~~clad~~ cladding layer of a third conductivity type, and a part of said optical amplifying layer into an optical waveguiding layer,~~

~~a waveguide ridge production step of forming a waveguide ridge by removing respectively a part parts of said ~~clad~~ cladding layer of the first conductivity type, said optical amplifying layer, and said first ~~clad~~ cladding layer of the second conductivity type,~~

~~an embed growth production step of forming a semiconductor layer of the second conductivity type so as to embed embedding a semiconductor block of the first conductivity type at both sides of said waveguide ridge, and forming a second ~~clad~~ cladding layer of the second conductivity type and a contact layer sequentially above said semiconductor layer of the second conductivity type and said first ~~clad~~ cladding layer of the second conductivity type,~~

~~a surface electrode production step of forming an insulation layer on top of said contact layer, and partially removing said insulation layer ~~partially~~ to form a contact electrode at a region where said insulation layer was removed, and~~

~~a back electrode production step of forming an electrode at a backside of said semiconductor substrate.~~